DOCUMENT RESUME

ED 325 084 IR 014 670

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TITLE A Staff Development Approach for Computer Integration.
PUB DATE Mar 89
NOTE 6p.; Paper presented at the International Conference on Technology and Education (6th, Orlando, FL, March 21-23, 1989).
PUB TYPE Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Adoption (Ideas); Change Strategies; Computer Assisted Instruction; *Computer Literacy; Courseware; Foreign Countries; *Inservice Teacher Education; Microcomputers; Needs Assessment; Postsecondary Education; Questionnaires; Secondary Education; *Secondary School Teachers; *Staff Development; *Teacher Attitudes; Teacher Workshops
IDENTIFIERS *Netherlands; Stages of Concern Questionnaire

ABSTRACT

Within the framework of the Dutch national policy for the integration of computers in education, a cooperative research and development project is being carried out by two pilot schools (grades 7-12) and a team of researchers. Based on the results of an analysis of experiences and current practice on computer use in the two pilot schools and findings from research literature on teacher training, a plan for inservice training at the school-building level has been developed. The emphasis is on the training of teachers within the same subject area. This training consists of five steps: (1) orientation to and selection of courseware; (2) hands-on experience with this courseware; (3) development of an instructional unit in which courseware integration is realized; (4) execution and observation, by colleagues, of this unit; and (5) reflection and revision. The aim of the training is to improve the skills and confidence of teachers in computer use, and to stimulate the interaction between teachers in exploring and realizing computer integration in their teaching practice. (6 references) (Author/DB)

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A STAFF DEVELOPMENT APPROACH FOR COMPUTER INTEGRATION

by

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International Conference on
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Orlando, Florida
March 1989

IR014670

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Paper presented at the 6th ITCE, [illegible], March 199[illegible]

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ABSTRACT

Within the framework of the Dutch national policy for the integration of computers in education, a cooperative R&D-project is being carried out by two pilot schools (secondary education, grades 7-12) and a team of researchers.
Based on the results of an analysis of experiences and current practice on computer use in the two pilot schools and findings from research literature on teacher training, a plan for inservice training at the school-building level has been developed. The emphasis is on the training of teachers within the same subject area. This training consists of five steps: orientation to and selection of courseware; hands-on experience with this courseware; development of an instructional unit in which courseware integration is realized; execution and observation by colleagues of this unit; reflection and revision.
The aim of the training is twofold:
- improving the skills and confidence of individual teachers in computer use,
- stimulating the interaction between teachers in exploring and realizing computer integration in their teaching practice.

CONTEXT

A few years ago the Dutch Minister of Education and Science started the project, New Information Technology in Secondary Education. One of its objectives was to place at the disposal of each secondary school in the Netherlands eight MS-Dos computers. Although it was clear that eight computers for one school was a very small number with which to promote an intensive use of computers in the schools, the available budget set this restriction. However, in order to explore the possibilities of the use of computers in a technology-enriched environment, the Minister started the Experimental Schools Project (ESP). This R&D-project is being carried out by two pilot schools for non-vocational secondary education (Grades 7-12) and a team of researchers from the University of Twente. One school consists of about 1000 students and 71 teachers, the other school comprises about 1700 students and 98 teachers. Both are city schools with a great interest in computer use and some enthusiatic teachers, but with an average computer use. The schools are now equipped with 30 computers each, spread over two computer classrooms, and receive funding for approximately 1200 hours of released time for teachers participating in the project. A comparable project is being carried out by researchers from the University of Amsterdam in collaboration with one school.
The aim of the ESP is to investigate various ways of realizing computer integration in the two pilot schools.The relevance of the ESP consists of the possibility to explore at the present time the educational use of computers in a school context that can be expected to be similar to a normal school context in about five to ten years in the future. The experiences of the pilot schools and the results of the research of the ESP will be made available to other schools, so that at the proper time the large-scale use of computers will be facilitated.
This paper deals with COMPRO (Computers in Pilot schools)--one of the research projects of the ESP--that investigates a crucial factor in the endeavour to integrate computers: staff development.

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THE SITUATION AT THE START

The project COMPRO started in December 1987 with an analysis of experiences and current practice with computer use in the two pilot schools. The information was collected in four ways.

1. Information on **the experiences and current practice** with computer use was collected in December 1987 by a **questionnaire** distributed among the 169 teachers at the pilot schools, of whom 113 (67%) responded. At the time of the survey, about 38% of the respondents had made use of a computer, 32% had oriented themselves on computer use, and 30% had not. However, only 11% of the respondents had used a computer in their lessons. Within the past few years 19% had followed some external training on computers. Seventy eight percent indicated they had an interest in training. About half of the respondents were especially interested in subject matter-oriented training, but only 20% had the intention to use, within a short time, computers in their lessons. An interesting conclusion of this survey is that there appears to be a time lag of at least one year between an orientation to computers and their use in lessons, and that it will not be until approximately two years after the orientation that there is an obvious increase in computer use.
2. **Interviews** were held with the two computer coordinators and a random sample of 15 teachers about their current experiences and practice and their **preferences concerning computer use and inservice training.** A major conclusion from these interviews is that teachers are interested in information about the use of computers in the subject area they teach, computer use that fits into in the regular curriculum.
3. An assessment of **the attitude of all the teachers** of the pilot schools with regard to computer use was needed to know the initial strength and breadth of the support and interest in computers. This was measured in January 1988 by using a Dutch translation and adaptation (ref 1) of the **Stages of Concerns Questionnaire** (ref 2). The seven stages (subscales)in the Dutch version are: 1) Awareness, 2) Informational/personal, 3) Consequence, 4) Management, 5) Collaboration, 6) Refocusing, and 7) Revision. There were 52 questions. The response rate to this questionnaire was low: only 40% of the teachers filled it out. With reference to this response rate the computer coordinators reported that many teachers felt they had to analyze carefully the different questions, instead of simply responding in a spontaneuos manner. Also, many teachers found it to be a "boring" questionnaire because of so many questions that look alike, a characteristic of this type of questionnaire. An analysis of the average score on the subscales shows that the responses from both pilot schools follow the same pattern: the highest scores are on Subscale 2 (Informational/personal) and lower scores on the following Subscales. This pattern is characterised as a "non-user profile" (ref 2). The modal score on Subscale 2 is an indication that the teachers have a need for information concerning the integration of computers into the curriculum.
4. In the period February-June 1988 seven pilot **inservice workshops** were organized. Emphasis was laid on practical examples of computer use and on hands-on experiences. The workshops were highly appreciated. About 40% of the teachers attended at least one workshop and for 14 teachers it was their first experience with a computer. Although the examples were general, the teachers had special interest in the possibilities of the applications in the subject areas they teach.

FINDINGS FROM RESEARCH LITERATURE

Teacher-training studies have revealed important components of training. For maximum effectiveness of training, Joyce and Showers (ref 3) recommend five components to be combined, namely, theory, demonstration , practice, feedback, and coaching. The practice component is particularly essential in the case of training new activities like computer use. Findings from a number of computer training experiences demonstrate that "hands-on-practice" as the core instructional method is successful, and the training

should be concrete and practical to motivate teachers (ref 4). Integration of computer use in the curriculum will be more likely to be enhanced when teachers in the same subject area work together. Furthermore, training becomes more effective when spread out over a period of time, allowing teachers to go back to the classroom and apply what they have learned (ref 5). Training that takes place at the teachers' school, delivered by enthusiastic and knowledgeable teachers who train their colleagues--a model known as multiplier training--provides ongoing support (ref 6).

A STAFF DEVELOPMENT APPROACH

Derived from the analysis of the ESP situation at its start and from the research findings, the two most important aims of the teacher training program for the ESP are:

- improving the skills and confidence of individual teachers in computer use,
- stimulating the interaction between teachers in exploring and realizing computer integration in their teaching practice.

With these two aims as guiding principles and taking into account other data from the analysis and the literature, the researchers of the COMPRO project and the computer coordinators of the pilot schools developed a plan for school-based teacher training. This plan consists of two components: a training in general computer skills and a training in computer use within a subject area. The computer-skills training is planned and executed by the computer coordinator. The goal of this training is to make teachers able to run ready-made software. It consists of five sessions, completed with individual exercises, and deals with basic computer skills and with word processing.

The emphasis in the overall teacher training program however is not on these basic skills but on the training of teachers within the same subject area, organized in one section. A section can start when at least some of its members master the basic computer skills, such as by following the computer skills training.

The training in the subject-area sections consists of the following five steps:

1. Orientation to and viewing of courseware on some subject belonging to the curriculum; selection of a courseware package;
2. Hands-on experience with this courseware package and exploration of the possibilities, the pros and cons;
3. Evaluation of these experiences and in the case of a positive conclusion, development of an instructional unit in which the integration of courseware in existing courses is realized;
4. Execution of the instructional unit in the classroom by different teachers and with observation by collegues;
5. Reflection on the execution and revision of the instructional unit.

Steps 1, 3, and 5 take place during meetings of the section, while Steps 2 and 4 are to be executed individually. One cycle of the five steps takes from three to five months. After passing four to six times through the cycle, a section can summarize its findings and proceed to a revision of the subject-matter curriculum with a view to computer integration. A section plans its own activities. The computer coordinator or the computer assistent are on demand, available for advice and support. One teacher from each section is responsible for the organization of the five steps and the continuation of the activities. These teachers meet together every six weeks with the computer coordinator to report their progress, to share experiences, and to discuss their problems.

This approach has now been practiced since November 1988. It is too early to obtain "hard" evaluation data. Although the sections started with characteristics of hesitation and uncertainty among the teachers, and to some extent this is still the case, the confidence by teachers and computer coordinators in the use of computers is growing. We expect that the results of the next assessment of the attitude of the teachers in September 1990 with the aid of the Stages of Concerns Questionnaire show the "experienced-user profile" (ref 2).

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